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## Chemistry Final Exam College Prep

### Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1. The product of a combination reaction is  $\text{Ba}(\text{OH})_2$ . If one of the reactants is  $\text{H}_2\text{O}$ , what is the other reactant?
  - $\text{Ba}_2\text{O}$
  - $\text{BaO}$
  - $\text{BaH}$
  - $\text{BaO}_2$
- \_\_\_\_\_ 2. What is the correct formula for calcium dihydrogen phosphate?
  - $\text{CaH}_2\text{PO}_4$
  - $\text{Ca}_2\text{H}_2\text{PO}_4$
  - $\text{Ca}(\text{H}_2\text{PO}_4)_2$
  - $\text{Ca}(\text{H}_2\text{HPO}_4)_2$
- \_\_\_\_\_ 3. How many double covalent bonds are in an alkane?
  - 0
  - 1
  - 2
  - 3
- \_\_\_\_\_ 4. If a balloon is heated, what happens to the pressure of the air inside the balloon if the volume remains constant?
  - It increases.
  - It stays the same.
  - It decreases.
  - The change cannot be predicted.
- \_\_\_\_\_ 5. Using the periodic table, determine the number of neutrons in  $^{16}\text{O}$ .
  - 4
  - 8
  - 16
  - 24
- \_\_\_\_\_ 6. What is the name of the following compound?
 

$$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CCH}_2\text{CH}_3 \end{array}$$

  - butane
  - butanal
  - butanol
  - butanone
- \_\_\_\_\_ 7. The products of a combustion reaction do NOT include \_\_\_\_\_.
  - water
  - carbon dioxide
  - carbon monoxide
  - hydrogen
- \_\_\_\_\_ 8. Which of the following compounds has the formula  $\text{KNO}_3$ ?
  - potassium nitrate
  - potassium nitride
  - potassium nitrite
  - potassium nitrogen oxide
- \_\_\_\_\_ 9. If a balloon is squeezed, what happens to the pressure of the gas inside the balloon?
  - It increases.
  - It stays the same.
  - It decreases.
  - The pressure depends on the type of gas in the balloon.
- \_\_\_\_\_ 10. What is the name of the compound  $\text{CH}_3\text{CH}(\text{CH}_3)\text{C}(\text{CH}_3)_3$ ?
  - 2,2,3-trimethylbutane
  - tetramethylpropane
  - 1,1,1,2-tetramethylpropane
  - isoheptane

Name: \_\_\_\_\_

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\_\_\_\_ 18. The process of adding a known amount of solution of known concentration to determine the concentration of another solution is called \_\_\_\_.

- a. neutralization
- b. hydrolysis
- c. titration
- d. buffer capacity

\_\_\_\_ 19. What is the electron configuration of potassium?

- a.  $1s^2 2s^2 2p^2 3s^2 3p^2 4s^1$
- b.  $1s^2 2s^2 2p^{10} 3s^2 3p^3$
- c.  $1s^2 2s^2 3s^2 3p^6 3d^1$
- d.  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$

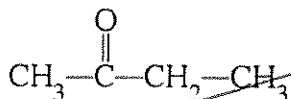
\_\_\_\_ 20. A ketone has the general structure \_\_\_\_\_.

- a.  $R-O-R$
- b.  $R-C(=O)-R$
- c.  $R-C(=O)-H$
- d.  $R-C(=O)-OR$

\_\_\_\_ 21. How many unpaired electrons are in a sulfur atom (atomic number 16)?

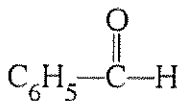
- a. 0
- b. 1
- c. 2
- d. 3

\_\_\_\_ 22. What type of compound is the following?



- a. alcohol
- b. aldehyde
- c. ether
- d. ketone

\_\_\_\_ 23. What is the name of the following compound?



- a. phenylhyde
- b. cyclohexylhyde
- c. benzaldehyde
- d. phenol aldehyde

\_\_\_\_ 24. Which carbon skeleton represents an ether?

- a.  $C-C-C-O-C-C-C$
- b.  $C-C-C-C-C-C=O$
- c.  $C-C-C-C-C(=O)-C$
- d. none of the above

\_\_\_\_ 25. What is the correct formula for barium chlorate?

- a.  $Ba(ClO)_2$
- b.  $Ba(ClO_2)_2$
- c.  $Ba(ClO_3)_2$
- d.  $BaCl_2$

Commonly Used Metric Prefixes		
Prefix	Meaning	Factor
mega (M)	1 million times larger than the unit it precedes	$10^6$
kilo (k)	1000 times larger than the unit it precedes	$10^3$
deci (d)	10 times smaller than the unit it precedes	$10^{-1}$
centi (c)	100 times smaller than the unit it precedes	$10^{-2}$
milli (m)	1000 times smaller than the unit it precedes	$10^{-3}$
micro ( $\mu$ )	1 million times smaller than the unit it precedes	$10^{-6}$
nano (n)	1000 million times smaller than the unit it precedes	$10^{-9}$
pico (p)	1 trillion times smaller than the unit it precedes	$10^{-12}$

- \_\_\_\_\_ 34. What is the quantity 0.0075 meters expressed in centimeters? Use the table above to help you.
- 0.075 cm
  - 0.75 cm
  - 7.5 cm
  - 70.5 cm
- \_\_\_\_\_ 35. The equation  $2C_3H_7OH + 9O_2 \rightarrow 6CO_2 + 8H_2O$  is an example of which type of reaction?
- combustion reaction
  - single-replacement reaction
  - double-replacement reaction
  - decomposition reaction
- \_\_\_\_\_ 36. Which of these elements does not exist as a diatomic molecule?
- Ne
  - F
  - H
  - I
- \_\_\_\_\_ 37. What is the name of the alkane having five carbons?
- propane
  - methane
  - octane
  - pentane
- \_\_\_\_\_ 38. How many carbons are in a molecule of hexane?
- 3
  - 4
  - 5
  - 6
- \_\_\_\_\_ 39. What is the molar mass of  $(NH_4)_2CO_3$ ?
- 144 g
  - 138 g
  - 96 g
  - 78 g
- \_\_\_\_\_ 40. Which of the following mass units is the largest?
- 1 cg
  - 1 dg
  - 1 mg
  - 1 ng
- \_\_\_\_\_ 41. Molecular compounds are usually \_\_\_\_.
- composed of two or more transition elements
  - composed of positive and negative ions
  - composed of two or more nonmetallic elements
  - exceptions to the law of definite proportions

- \_\_\_\_\_ 53. Which statement is true about electronegativity?
- Electronegativity is the ability of an anion to attract another anion.
  - Electronegativity generally increases as you move from top to bottom within a group.
  - Electronegativity generally is higher for metals than for nonmetals.
  - Electronegativity generally increases from left to right across a period.
- \_\_\_\_\_ 54. Aluminum reacts with sulfuric acid to produce aluminum sulfate and hydrogen gas. How many grams of aluminum sulfate would be formed if 250 g  $\text{H}_2\text{SO}_4$  completely reacted with aluminum?
- $$2\text{Al}(s) + 3\text{H}_2\text{SO}_4(aq) \rightarrow \text{Al}_2(\text{SO}_4)_3(aq) + 3\text{H}_2(g)$$
- 0.85 g
  - 290 g
  - 450 g
  - 870 g
- \_\_\_\_\_ 55. Which combination of temperature and pressure correctly describes standard temperature and pressure, STP?
- ~~0°C and 101 kPa~~
  - ~~1°C and 0 kPa~~
  - 0°C and 22.4 kPa
  - 100°C and 100 kPa
- \_\_\_\_\_ 56. What is the electron configuration of the oxide ion ( $\text{O}^{2-}$ )?
- $1s^2 2s^2 2p^4$
  - $1s^2 2s^2 2p^6$
  - $1s^2 2s^2$
  - $1s^2 2s^2 2p^2$
- \_\_\_\_\_ 57. What are the coefficients that will balance the skeleton equation below?
- $$\text{AlCl}_3 + \text{NaOH} \rightarrow \text{Al}(\text{OH})_3 + \text{NaCl}$$
- 1, 3, 1, 3
  - 3, 1, 3, 1
  - 1, 1, 1, 3
  - 1, 3, 3, 1
- \_\_\_\_\_ 58. Which of the following pairs of elements is most likely to form an ionic compound?
- magnesium and fluorine
  - nitrogen and sulfur
  - oxygen and chlorine
  - sodium and aluminum
- \_\_\_\_\_ 59. Which of the following shows correctly an ion pair and the ionic compound the two ions form?
- $\text{Sn}^{4+}, \text{N}^{3-}; \text{Sn}_4\text{N}_3$
  - $\text{Cu}^{2+}, \text{O}^{2-}; \text{Cu}_2\text{O}_2$
  - $\text{Cr}^{3+}, \text{I}^-; \text{CrI}$
  - $\text{Fe}^{3+}, \text{O}^{2-}; \text{Fe}_2\text{O}_3$
- \_\_\_\_\_ 60. Which of the following elements has the smallest atomic radius?
- sulfur
  - chlorine
  - selenium
  - bromine
- \_\_\_\_\_ 61. The complete combustion of which of the following substances produces carbon dioxide and water?
- $\text{C}_8\text{H}_{18}$
  - $\text{K}_2\text{CO}_3$
  - $\text{CaHCO}_3$
  - NO
- \_\_\_\_\_ 62. What is the number of moles in 9.63 L of  $\text{H}_2\text{S}$  gas at STP?
- 0.104 mol
  - 0.430 mol
  - 3.54 mol
  - 14.7 mol
- \_\_\_\_\_ 63. All atoms are \_\_\_\_\_.
- positively charged, with the number of protons exceeding the number of electrons
  - negatively charged, with the number of electrons exceeding the number of protons
  - neutral, with the number of protons equaling the number of electrons
  - neutral, with the number of protons equaling the number of electrons, which is equal to the number of neutrons